PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Applicant:	Jeffrey Morgan Alden et al.
Group Art Unit:	2815
Examiner:	Eugene Lee
Title:	AUTOMATIC RECONFIGURATION OF SYSTEM SUB-MODELS FOR INDEPENDENT ANALYSIS
Attorney Docket:	GP-301022

APPELLANT'S NEW BRIEF

Pursuant to 37 CFR §41.37, Appellant hereby reinstates their appeal in response to the Office Action mailed December 31, 2007 reopening prosecution of this application. Appellant has paid the Notice of Appeal fee on July 14, 2005 and the Appeal Brief fee on August 11, 2005. Pursuant to 37 CFR §41.31, Appellant is filing a Second Notice of Appeal herewith. Further, pursuant to 37 CFR §41.20, Appellants are submitting the increase in the Notice of Appeal and Appeal Brief fee by authorizing the payment of the difference in fees paid previously and the current fees to be charged to General Motors Deposit Account 07-0960.

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I. Real Party in Interest

The real party in interest for this appeal is General Motors Corporation of Detroit, Michigan, the assignee of the application.

II. Related Appeals and Interferences

There are no related appeals or interferences.

III. Status of the Claims

Claims 1-19 are pending in this application. Claims 1-19 are on appeal. Claims 1-19 stand rejected. No claim has been allowed. No claim has been objected to. No claim has been withdrawn.

IV. Status of Amendments

All amendments have been entered.

V. Summary of the Claimed Subject Matter

Appellant's invention as claimed in independent claims 1, 8 and 13 is a method (74) for analyzing a sub-model (70, 90) that is a portion of a full system model (20). Figure 2 shows the full system model (20), and figures 5 and 7 show the sub-models (70) and (90), respectively. The system model (20) is representative of a certain system, such as a system for maintenance planning in a plant, and the sub-models (50) and (70) are a portion of that system. In this embodiment, the sub-models (70) and (90) are influence diagrams. An influence diagram is a graphical display that shows a system model or operation of a system as a series of data entities and calculation entities interconnected by arrows or arcs. One can observe changes to the system

model by changing one or more of the data entities, and then watching how other entities in the influence diagram respond. For example, the size of the entities may change to show how the various data entries change. Therefore, the influence diagram provides a tool for analyzing the system model, in this case, a portion of the system model, without actually running the system. Paragraph [0025], page 6, line 22-page 7, line 12, of the specification provides specific examples of how the influence diagram is beneficial.

Appellant has defined data entities and calculation entities in the specification, particularly in paragraph [0023], page 5, line 24-page 6, line 11, and throughout the prosecution of this application. Entities are visual objects that include one or more things that define the system. A data entity includes a predetermined data value or values. A calculation entity includes a formula that calculates an output based on input values, where the input values come from other entities, including data entities and/or other calculation entities. The relationship between the entities are shown by arrows.

In the claimed invention of independent claims 1, 8 and 13, the sub-model (70, 90) is defined as part of the full system model (20). Once the sub-model (70) is defined, those calculation entities (26) in the sub-model (70) that depend on entities in the full model (20) that are not in the sub-model (70) are converted to data entities (24), paragraph [0040], page 13, lines 3-11. One or more of the entities in the sub-model (70) may be identified as output entities if they are calculation entities (26) that do not have an output to another entity, paragraph [0042], page 13, line 21 - page 14, line 1. When the sub-model (70) is run, the formulas in the calculation entities are calculated, and the size of one or more of the data entities (24) in the sub-model (70) changes in response thereto. A person can visually look at the changes in the data entities (24) to determine the operation of that portion of the full system model (20). Thus, a portion of the full

system model (20) can be run without having to run the full system model (20) or the system. Based on this information, a person can remedy potential problems or deficiencies in the system before they occur when running the system. Any suitable computer code and language can be employed to perform the algorithm of the invention as discussed herein.

VI. Grounds of Rejection to be Reviewed on Appeal

Whether claims 1-19 should be rejected under 35 USC §112, second paragraph, as being indefinite; whether claims 1-19 should be rejected under 35 USC §101 because the claimed invention is directed to non-statutory subject matter; and whether claims 1-19 should be rejected under 35 USC §102(b) as being anticipated by US Patent No. 5,630,127 issued to Moore et al. (hereinafter Moore).

VII. Argument

A. Claims 1 – 19 are definite under §112, second paragraph

The Examiner has held that all of Appellant's claims 1-19 are indefinite under 35 USC §112, second paragraph, because several of Appellant's claimed elements allegedly lack antecedent basis. Particularly, the Examiner has stated that the terms "entities in the full model" in claim 1, "the calculations," in claim 1, "the size" in claim 1, "connecting arcs" in claim 2, "isolated cycles" in claim 3 and "all global variables" in claim 7 lack sufficient antecedent basis. Further, the Examiner has held that the limitation of "converting the calculation entities in the sub-model that depend on entities in the full model that are not included in the sub-model into temporary data entities" is indefinite because "calculation entities" and "data entities" are both values.

MPEP 2173.02 states that, "[i]n reviewing a claim for compliance with 35 USC §112, second paragraph, the examiner must consider the claim as a whole to determine whether the claim apprises one of ordinary skill in the art of its scope and, therefore, serves the notice function required by 35 USC §112, second paragraph, by providing clear warnings to others as to what constitutes infringement of the patent." MPEP 2173.05(e) addresses lack of antecedent basis under §112, second paragraph, stating, "[a] claim is indefinite when it contains words or phrases whose meaning is unclear. The lack of clarity could arise where a claim refers to "said lever" or "the lever," where the claim contains no earlier recitation or limitation of a lever and where it would be unclear as to what element the limitation was making reference."

Appellant submits that the language "entities in the full model," "connecting arcs," "isolated cycles" and "all global variables" are not preceded by the terms "said" or "the". Therefore, Appellant respectfully submits that it is improper to hold that these terms are indefinite under §112, second paragraph, for lack of antecedent basis.

MPEP 2173.05(e) also states that, "[i]nherent components of elements recited have antecedent basis in the recitation of the components themselves. For example, the limitation "the outer surface of said sphere" would not require an antecedent basis recitation that the sphere has an outer surface."

Appellant respectfully submits that the recitation "the calculations" for the calculation entities satisfies the requirements of §112, second paragraph, and is not indefinite because the scope of this claim limitation would be reasonably ascertainable by those skilled in the art.

Appellant respectfully submits that the terminology "the size" also satisfies the requirements of §112, second paragraph, because one of ordinary skill in the art would readily recognize that the at least one data entity would have a size.

Appellant respectfully submits that the clause "converting the calculation entities in the sub-model that depend on entities in the full model that are not included in the sub-model into temporary data entities" also satisfies the requirements of §112, second paragraph, because this limitation is reasonably ascertainable by those skilled in the art when taking the claim as a whole, especially in light of the specification.

B. Claims 1-19 include statutory subject matter

Appellant submits that claims 1 – 19 fully comply with §101. MPEP 2106 states that a claimed invention is in compliance with §101 if it produces a "useful, concrete and tangible result." The Examiner states that claims 1-19 are directed to non-statutory subject matter because the claims are drawn to a process that does nothing more than manipulate an idea, and do not claim a practical application.

MPEP 2106 II A states that the Examiner has "the burden to establish a *prima facie* case that the claimed invention as a whole is directed to solely an abstract idea or to manipulation of abstract ideas or does not produce a useful result. Only when the claim is devoid of any limitation to a practical application in the technological arts should it be rejected under 35 USC 101." Appellant respectfully submits that the Examiner has not met this burden because he has not specifically stated how all of the claims are devoid of any limitation to a practical application.

Appellant submits that the claimed invention does produce a useful, concrete and tangible result because it allows a person to visually analyze the operation of a system that the system model represents by observing changes in the model as data is manipulated. The claimed invention is useful because the operation of the system can be observed to identify problem areas without having to incur the expense of operating the system. The claimed invention is concrete because changes in the sub-model,

particularly the size of data entities, are provided in a physical visual medium so that the operation of the system can be better understood. The claimed invention is tangible because things (entities) are specifically defined that have a specific purpose in the system model and identify a specific thing about the system. All of the things are defined by the user, and they all combine to provide the useful result of being able to analyze the system.

The claimed invention further has useful, concrete and tangible results because it allows the system model to be separated into sub-models so that a person can analyze a portion of the operation of the system without having to analyze the whole system model. Appellant further submits that the claimed invention is useful because it provides a manner in which calculation entities in the sub-model that depend on entities in the full-model that are not included in the sub-model are converted into temporary data entities. In this manner, the sub-model can operate separately from the full system model because no entity in the sub-model relies on an input from an entity outside of the sub-model after the conversion.

Moreover, the invention as claimed satisfies §101 because it is more than an abstract idea and requires "physical acts to be performed outside of the computer," MPEP 2106B 2(b)(i). Particularly, the system model provides a visual representation of the operation of the system as input data changes, and therefore the entities are represented in a visual medium. A person who wishes to study or examine the operation of the system model visually analyzes changes in the model in response to the calculations of the calculation entities.

Appellant respectfully brings the Board's attention to Ex-Parte Lundgren, 76 USPQ 2d 1385 (BdPatApp&Int 2005), where the Board held twice that the following claim includes patentable subject matter under §101.

1. A method of compensating a manager who exercises administrative control over operations of a privately owned primary firm for the purpose of reducing the degree to which prices exceed marginal costs in an industry, reducing incentives for industry collusion between the primary firm and a set of comparison firms in said industry, or reducing incentives for coordinated special interest lobbying, said set of comparison firms including at least one firm, said primary firm having the manager who exercises administrative control over said primary firm's operations during a sampling period, wherein privately owned means not wholly government owned, the method comprising the steps of:

a) choosing an absolute performance standard from a set of absolute performance standards;

b) measuring an absolute performance of said primary firm with respect to said chosen absolute performance standard for said sampling period;

c) measuring an absolute performance of each firm of said set of comparison firms with respect to said chosen absolute performance standard for said sampling period, said measurement of performance for each firm of said test of comparison firms forming a set of comparison firm absolute performance measures;

d) determining a performance comparison base based on said set of comparison firm absolute performance measures by calculating a weighted average of said set of comparison firm absolute performance measures;

e) comparing said measurement of absolute performance of said primary firm with said performance comparison base;

f) determining a relative performance measure for said primary firm based on said comparison of said primary firm measurement of absolute performance and said performance comparison base;

g) determining the managerial compensation amount derived from said relative performance measure according to a monotonic managerial compensation amount transformation; and

h) transferring compensation to said manager, said transferred compensation having a value related to said managerial compensation amount.

Appellant respectfully submits that if this claim includes statutory subject matter, then claims 1-19 include statutory subject matter.

C. Independent claims 1, 8 and 13 are not anticipated by Moore

1. Anticipation

MPEP 2131 states that, "[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." It is the Examiner's position that each and every element in all of claims 1-19 are found in Moore. For the reasons given below, Appellant submits that this position is improper.

2. Independent claims 1, 8 and 13

Both of the independent method claims 1 and 8 include the following method steps:

defining the sub-model as a collection of entities in a visual medium;

determining which of the entities in the sub-model are calculation entities and which are data entities;

converting the calculation entities in the sub-model that depend on entities in the full model that are not included in the sub-model into temporary data entities;

identifying the output entities in the sub-model, where the output entities are calculation entities that do not have an output to another entity; and

visually analyzing changes in the sub-model in response to performing the calculations for the calculation entities.

Independent apparatus claim 13 includes:

means for defining a sub-model as a collection of entities in a visual medium;

means for determining which of the entities in the sub-model are calculation entities and which are data entities;

means for converting the calculation entities in the sub-model that depend on entities in the full model that are not included in the sub-model into temporary data entities;

means for identifying output entities in the sub-model where the output entities are calculation entities that do not have an output to another entity; and

means for visually analyzing changes in the sub-model in response to performing the calculations of the calculation entities.

3. Moore

Moore discloses a global risk management system (GRMS) 100 shown in figure 1. The GRMS 100 includes a direct access storage device 102 and GRMS applications 108. The GRMS 100 allows a financial institution to implement risk management in a consistent and timely manner, taking into account the dynamics of the marketplace, column 3, lines 44-47.

4. Discussion

It is the Examiner's position that all of claims 1-19 are anticipated by Moore based on the following arguments from pages 5 and 6 of the Office Action.

> Moore discloses (see, for example, FIG.1) a method of analyzing a computer system (full system model) 100 comprising a database (sub-model as a collection of entities) 102, calculation entities/data entities (see, for example, column 4, lines 53-67), primitive values (temporary data entities; see, for example, column 2, lines 26-37), and value (size).
>
> Regarding the limitation "converting the calculation entities in the sub-model into temporary data entities", see, for example, column 4, lines 45-51 wherein Moore discloses files sent to GRMS from external sources (entities in the full model that are not included in the sub-model). Further, Moore discloses (see, for example, column 4, lines 62-67) that a calculation (i.e. calculation entities) is performed in the GRMS, and a long report to be created (temporary data entities) and routed to one or many people of the organization or no further

> action (calculation entities that do not have an output to another entity). Moore discloses a result handler (visually analyzing changed) which has rules to follow for the disposition of the result.

It is Examiner's position that the GRMS 100 represents Appellant's claimed full system model and that the database 102 is Appellant's claimed sub-model that is collection of entities in a visual medium, where the database 102 includes both calculation entities and data entities as claimed. The Examiner supports this position citing column 4, lines 53-67, recreated below.

> Data and rules will be stored in the GRMS database 102. The data will be stored as a relational database, preferably utilizing the IBM database DB2 or other comparable relational database, and are part of the CMIS database 102. Rules for GRMS will be stored as objects in the database. The term "object" is an abstraction (like a variable in mathematics) that represents a value that is returned by an associated retrieval program. The object concept of the present invention allows the rule to be reused for different data applicable to many types of events.
>
> Once the calculation is performed in GRMS, the result of the calculation is passed to a result handler. The result handler will also have rules to follow for the disposition of the result. Results can cause an update to the CMIS database 102, a long report to be created and routed to one or many people of the organization, or no further action.

Appellant submits that this section of Moore talks about data and rules stored in the database 102, and is not a sub-model that is part of a system model where the sub-model is a collection of entities in a visual medium and where the sub-model includes both calculation entities and data entities as defined.

The Examiner goes on to state that Appellant's claimed temporary data entities that are calculation entities in the sub-model that depend on entities in the full model that are not included in the sub-model can be found in column 2, lines 26-37, recreated below.

> The rules are stored in a database as objects. When the system is to perform a risk calculation based upon a specific rule, the application program retrieves that rule from the database. The rule is stored in the database in the form of a table. The application program then performs a calculation based upon the retrieved rule. The primitive values used to

> process the rule are stored and can be modified by a user to run "what-if" scenarios. The table structure permits nested mathematical formulas using objects (including rules) as variables. More complex mathematical formulas can be stored as programs but accessed in the same manner as an object.

This section of Moore talks about rules being stored in the database 102 that include primitive values used to process the rules, which are also stored in the database. Appellant respectfully submits that this does not satisfy the requirement of Appellant's claimed temporary data entities.

The Examiner cites column 4, lines 45-51 in Moore as also teaching this limitation of the independent claims. That section of Moore is recreated below.

> Files sent to GRMS from external sources will also be processed into discrete events. A file is a structural collection of information that is comprised of records. GRMS 108 will decompose the files into event messages that will be processed through the GRMS system. Each file can be recognized into this system of event messages following a set of rules established for the file type

This section of Moore talks about a file being a structural collection of information comprised of records and that the GRMS 108 will decompose the files into event messages that will be processed by the system 100. Appellant respectfully submits that this has nothing to do with converting calculation entities in the sub-model that depend on entities in the full model that are not included in the sub-model into temporary data entities.

The Examiner also states that the temporary data entities can be found in column 4, lines 62-67 as a long report. This section talks about calculations performed in the GRMS where the results are passed to a result handler. Appellant submits that this is different than the claimed temporary data entities.

5. The dependent claims are not anticipated by Moore

The Examiner has not addressed any of the claim elements of the dependent claims as being shown by Moore. Appellant can find no teaching in Moore of the elements of the dependent claims. Without some perspective as to where these elements can be found in Moore, Appellant is at a loss as to how to respond.

VIII. Conclusion

Appellant respectfully submits that claims 1-19 are not indefinite, that claims 1-19 include statutory subject matter and that claims 1-19 are anticipated by Moore. It is therefore respectfully requested that the Examiner's Rejections be withdrawn, and that Appellant's claims be allowed.

Respectfully submitted,

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CLAIMS APPENDIX

COPY OF CLAIMS INVOLVED IN THE APPEAL

1. A method of analyzing a sub-model of a full system model, said system model representing a system, said method comprising the steps of:

defining the sub-model as a collection of entities in a visual medium;

determining which of the entities in the sub-model are calculation entities and which are data entities;

converting the calculation entities in the sub-model that depend on entities in the full model that are not included in the sub-model into temporary data entities;

identifying output entities in the sub-model, where the output entities are calculation entities that do not have an output to another entity; and

visually analyzing changes in the sub-model in response to performing the calculations for the calculation entities, wherein visually analyzing changes in the sub-model includes analyzing changes in the size of at least one data entity.

2. The method according to claim 1 further comprising the step of deleting those entities that the temporary data entities depend on.

3. The method according to claim 1 further comprising the step of identifying isolated cycles in the sub-model.

4. The method according to claim 3 wherein the step of identifying isolated cycles includes selecting an entity in an isolated cycle as an output entity.

5. The method according to claim 4 wherein the step of selecting an entity in an isolated cycle as an output entity includes arbitrarily selecting an entity in the isolated cycle as an output entity.

6. The method according to claim 1 further comprising the step of assigning data to all data entities in the sub-model, sad step of assigning data including assigning data to the temporary data entities.

7. The method according to claim 1 further comprising the step of adding all global variables to the sub-model that were not included in the sub-model when it was part of the full model.

8. A method of analyzing a sub-model of a full system model, said system model representing a system, said method comprising the steps of:

defining the sub-model as a collection of entities in a visual medium;

determining which of the entities in the sub-model are calculation entities and which are data entities;

converting the calculation entities in the sub-model that depend on entities in the full model that are not included in the sub-model into temporary data entities;

deleting those entities that the temporary data entities depend on;

identifying output entities in the sub-model, where the output entities are calculation entities that do not have an output to another entity; and

visually analyzing changes in the sub-model in response to performing the calculations for the calculation entities.

9. The method according to claim 8 wherein the step of identifying isolated cycles includes selecting an entity in an isolated cycle as an output entity;

10. The method according to claim 8 wherein the step of selecting an entity in an isolated cycle as an output entity includes arbitrarily selecting an entity in the isolated cycle as an output entity.

11. The method according to claim 8 further comprising the step of assigning data to all data entities in the sub-model, said step of assigning data including assigning data to the temporary data entities.

12. The method according to claim 8 further comprising the step of adding all global variables to the sub-model that were not included in the sub-model when it was part of the full model.

13. A system for analyzing a sub-model separated from a full system model, said system model representing a system, said system comprising:

means for defining the sub-model as a collection of entities in a visual medium;

means for determining which of the entities in the sub-model are calculation entities and which are data entities;

means for converting the calculation entities in the sub-model that depend on entities in the full model that are not included in the sub-model into temporary data entities;

means for identifying output entities in the sub-model, where the output entities are calculation entities that do not have an output to another entity; and

means for visually analyzing changes in the sub-model in response to performing the calculations for the calculation entities.

14. The system according to claim 13 further comprising means for deleting those entities that the temporary data entities depend on.

15. The system according to claim 13 further comprising means for identifying isolated cycles in the sub-model.

16. The system according to claim 15 wherein the means for identifying includes means for selecting an entity in an isolated cycle as an output entity.

17. The system according to claim 16 wherein the means for selecting an entity includes arbitrarily selecting an entity in the isolated cycle.

18. The system according to claim 13 further comprising means for assigning data to all data entities in the sub-model and assigning data to the temporary entities.

19. The system according to claim 13 further comprising means for adding all global variables to the sub-model that were not included in the sub-model when it was part of the full model.

EVIDENCE APPENDIX

There is no evidence pursuant to §1.130, §1.131 or §1.132.

RELATED PROCEEDINGS APPENDIX

There are no decisions rendered by a court or the Board in any proceeding identified in Section II of this Appeal Brief.